SOUTH AFRICAN DEEP-SEA PYCNOGONIDA, WITH DESCRIPTIONS OF FIVE NEW SPECIES

By

J. H. Stock

Zoölogisch Museum, Amsterdam, Holland

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(With 10 figures in the text)

Contents

Introduction

The interesting collection of deep-sea Pycnogonida on which the present paper has been based was entrusted to me by Dr. F. H. Talbot of the South African Museum. Taking into consideration the considerable depths in which the animals were caught (ranging from 1,470 to 1,785 fathoms), and the relative rarity of Pycnogonida in general, the present collection is pretty rich both in species and in individuals.

The material collected belongs to 5 genera only: *Nymphon* (1 species), *Ascorhynchus* (1 species), *Colossendeis* (6 species), *Anoplodactylus* (1 species), and *Pantopipetta* (3 species). Although all of these were known to be restricted to, or to have representatives in, the deep sea, the occurrence of not less than 3 species of *Pantopipetta*, a very rare genus, is most surprising.

The strong armature of body and legs with long spurs and long, stiff setae in several of these abyssal species is a curious morphological phenomenon, and is at least for the genus *Nymphon* quite unusual.

Pycnogonid material was taken in the following deep trawlings (gear: 15′ beam trawl); Station A 193 especially was very rich in species and specimens.

Station A 192. 33° 45′ S., 16° 23½′ E. 1,480 fms. Aug. 27, 1959.
Station A 193. 33° 49′ S., 16° 30′ E. 1,500–1,580 fms. Aug. 27, 1959.
Station A 315. 34° 37′ S., 17° 03′ E. 1,580–1,620 fms. Dec. 8, 1959.
Station A 316. 34° 42′ S., 16° 54′ E. 1,725–1,780 fms. Dec. 8, 1959.
Station A 319. 34° 05′ S., 16° 58′ E. 1,470–1,490 fms. Dec. 9, 1959.
Station A 322. 34° 36′ S., 17° 00′ E. 1,500 fms. Dec. 10, 1959.

The holotypes of the new species are in the South African Museum, Cape Town; duplicates are in the Zoological Museum, Amsterdam.

Ann. S. Afr. Mus. **46** (12), 1963, 321–340, 10 figs.

Descriptions of Species

Nymphon laterospinum n.sp.

(Fig. 1)

Material. 1 ♂ ovig. Station A 193.

Description. Trunk fairly slender, completely segmented. Lateral processes separated by nearly 1½ times their own diameter; armed distally with spurs,

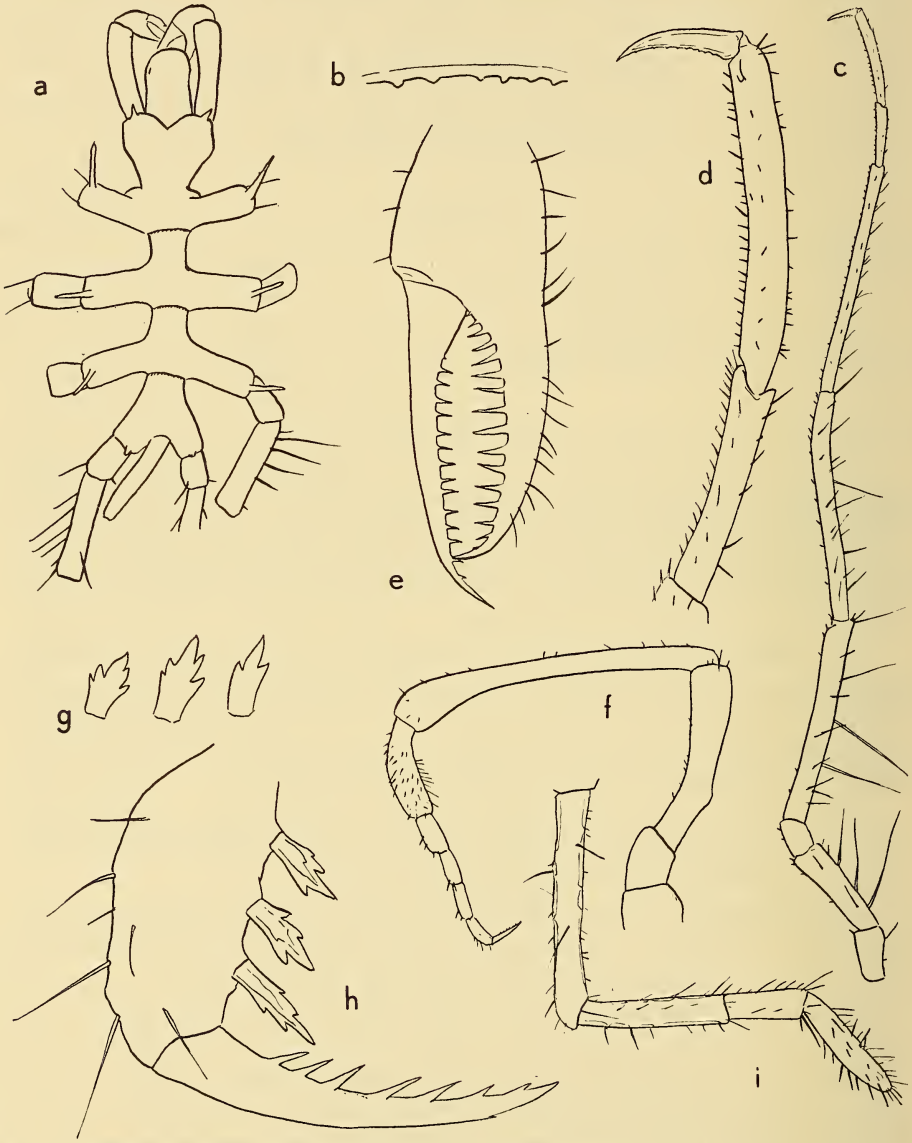

Fig. 1. *Nymphon laterospinum* n.sp., ♂ (holotype). *a*, dorsal view of the trunk; *b*, inner margin of the claw of a leg; *c*, first leg; *d*, distal segments of the first leg; *e*, chela; *f*, oviger; *g*, some special oviger spines; *h*, terminal part of the oviger; *i*, palp.

which are very tall and spiniform on lateral processes 1, 2 and 3, much shorter on lateral process 4. A protuberance of about the same size as that of the 4th lateral process is present on the neck, at the base of the chelifore. No eye tubercle, nor middorsal spurs. No eyes. Oviger implantation in contact with the first lateral process. Neck short, fairly broad. Abdomen long, reaching to at least a third of coxa 2 of leg 4. Proboscis about as long as the neck.

Fingers of chela nearly twice as long as the hand, curved; movable finger with about 16 short, spiniform teeth; immovable finger with the same number of stronger teeth.

Palp hairy; segment 1 short, segment 2 the longest (subequal to segments 3 and 4 combined), segment 5 slightly longer than segment 4.

Oviger segment 4 with a swelling at about a third of its length; segment 5 long, curved, distinctly clubbed distally; segment 6 very hairy; segments 7 to 10 with a small number of compound spines of a relatively simple structure, bearing only 1 to 3 serrations, according to the formula $5 + 3 + 3 + 3 = 14$. Terminal claw slender, slightly curved, longer than the 10th oviger segment, bearing 7 teeth at the inner margin. Eggs few (only two on each oviger in the only male available); they are collapsed now, but originally were probably large and rich in yolk.

Legs slender, setose; particularly coxa 2, femur and tibia 1, with very long, stiff setae; tibia 1 and 2 subequal; tarsus about $\frac{2}{3}$ of the propodus; propodus nearly straight; propodal sole with 20 to 25 small spinules of a size; claw about $\frac{2}{5}$ of the propodus, slightly curved, its inner margin armed with about 8 irregular denticulations.

Remarks. The only other slender, uniunguiculate, blind *Nymphon* that has the oviger implantation in contact with the first lateral process is *N. hedgpethi* Stock, 1953. Instead of spurs on the neck and the lateral processes, *N. hedgpethi* possesses long hairs on these spots. The new species is, by the presence of these spurs, and by its crenulated claw of the legs, particularly well characterized against the 120 other named taxa in this genus.

Measurements of the holotype (♂) *in mm.*

Length (frontal margin neck to base of abdomen)	3·3
Length of proboscis (in dorsal view)	0·89
Length of abdomen	0·7
Width across 2nd lateral processes	1·8

First leg—1st coxa, 0·52; 2nd coxa, 1·13; 3rd coxa, 0·33; femur, 2·20; 1st tibia, 2·44; 2nd tibia, 2·35; tarsus, 0·56; propodus, 0·89; claw, 0·34

Ascorhynchus inflatum n.sp.
(Figs. 2, 3)

Material. 4 specimens (2 of which adult females). Station A 193.

Description. Body completely segmented. Lateral processes separated by more than $1\frac{1}{2}$ times their own diameter. Neck rather slender, bearing two small

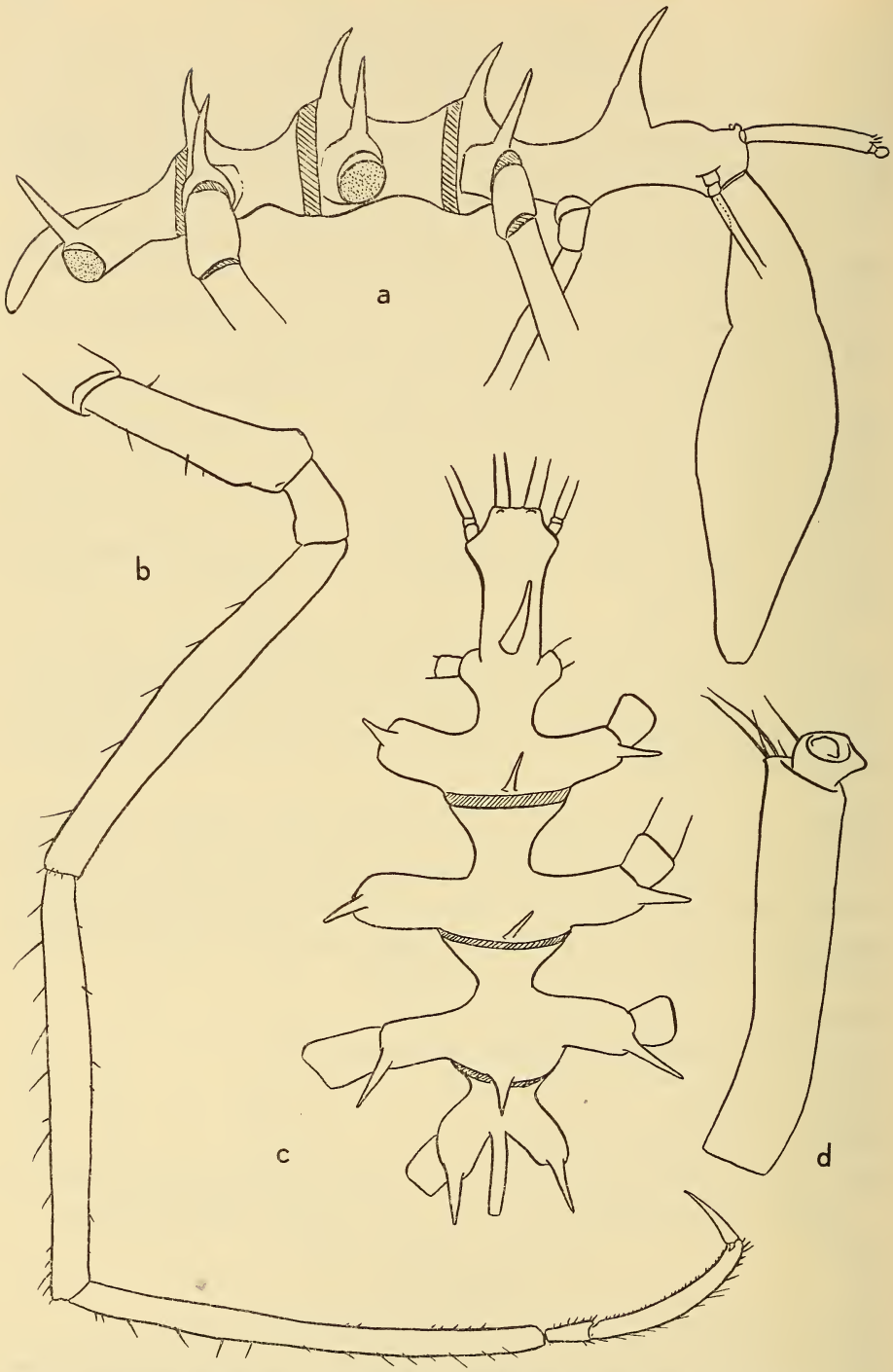

FIG. 2. *Ascorhynchus inflatum* n.sp., ♀ (holotype). *a*, lateral view of the trunk; *b*, fourth leg; *c*, dorsal view of the trunk; *d*, chelifore.

tubercles near the implantation of the chelifores. Basal protuberances for palps and ovigers distinct. Eye tubercle arising slightly in front of the oviger implantations, very tall, pointed, spine-like; eyes absent. Body segments 1, 2 and 3 with a tall, sharp medio-dorsal tubercle. Tubercles of about the same size and shape arise from the dorso-distal margin of the lateral processes. Abdomen curved, slender, much longer than the 4th lateral process. The posterior part of trunk segments 1, 2 and 3 and the anterior part of segments 2, 3 and 4 are strongly inflated. The articulation line runs just over this inflated part of the trunk segments. The proposed specific name refers to the curious gonflated aspect of the trunk segments.

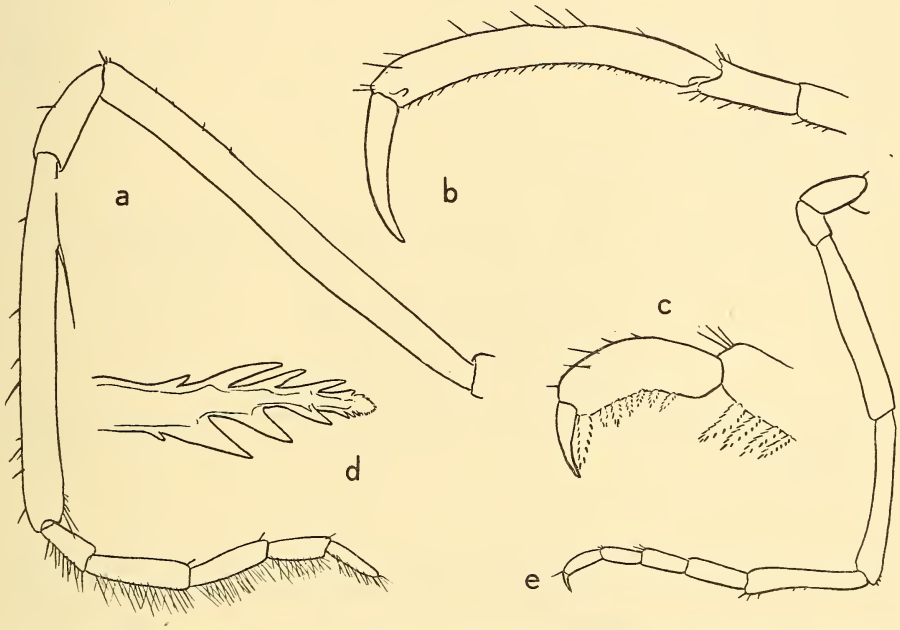

FIG. 3. *Ascorhynchus inflatum* n.sp., ♀ (holotype). *a*, palp; *b*, distal segments of fourth leg; *c*, terminal part of the oviger; *d*, compound oviger spine; *e*, oviger.

Basal third of proboscis distinctly separated from the distal two-thirds
Chelifore scape 1-segmented, rather long; chelae reduced.

Palps 10-segmented; basal two segments small; segment 3 the longest 4 distal segments gradually diminishing in length.

Oviger 10-segmented. Terminal claw slender, smooth. Compound spines, bearing 3 to 5 strong basal denticulations and numerous fine crenulations at the tip, are present on segments 7 to 10, according to the formula $7 + 7 + 7 + 7 = 28$.

Legs slender, rather setose, especially the tibiae, but without tubercles or protuberances. Tarsus less than $\frac{1}{3}$ of the propodus; it is about twice as long as wide. Propodus slightly curved, the sole armed over its entire length with

numerous small spinules of equal length. Claw short, distinctly less than half the propodus, feebly curved. No auxiliary claws. Genital pores (♀) on a very slight swelling of the ventro-distal surface of the 2nd coxa of all legs.

Remarks. This species is not unlike *A. abyssi* G. O. Sars, 1877, a blind northern Atlantic deep-sea species, but it differs notably from it in the much taller dorsal spurs, the taller eye tubercle, and the different mutual position of eye tubercle and oviger implantation.

Measurements of ♀ (*holotype*) *in mm.*

Length of trunk somite 1	2·7
Length of trunk somite 2	1·5
Length of trunk somite 3	1·5
Length of trunk somite 4	0·66
Length of proboscis	5·5
Length of abdomen	1·1
Width across 2nd lateral processes	2·2
Length of scape	1·3

Fourth leg—1st coxa, 0·66; 2nd coxa, 2·2; 3rd coxa, 0·70; femur, 5·2; 1st tibia, 5·2; 2nd tibia, 5·7; tarsus, 0·44; propodus, 1·54; claw, 0·66

Genus COLOSSENDEIS Jarz.

Brevitarsal group

Colossendeis macerrima Wilson

C. macerrima Wilson, Stock, 1953, pp. 308–311, fig. 17 *e–h* (lit., syn.). Barnard, 1954, p. 85.
C. japonica (*non* Hoek), Hedgpeth, 1949, pp. 299–300, fig. 46 *a–d.* Fage, 1956, p. 176 (new synonymy).

Material. 7 specimens. Station A 193.

Remarks. Barnard, 1954, and Flynn, 1928, have already recorded this species from South African waters. Concerning the proposed new synonymy, compare the remarks under *C. minuta.*

Colossendeis minuta Hoek
(Fig. 4)

C. minuta Hoek, 1881, pp. 73–74, pl. 10 figs. 12–14. Schimkewitsch, 1893, pp. 34–35 (tabulated only). Gordon, 1944, p. 13, fig. 2 *f–g* (remarks on holotype). Hedgpeth, 1948, p. 272, fig. 50 *c.*
C. japonica Hoek, 1898, pp. 295–296, figs. 11–13 (new synonymy).
[*Non*] '*C. japonica* Hoek', Hedgpeth, 1949, and Fage, 1956 (= *C. macerrima*).

Material. 3 specimens. Station A 193.

Remarks. Three specimens, quite striking as they have preserved their crimson colour, even in alcohol, agree in all particulars with the description of Hoek (1881) and the notes given by Gordon (1944) on Hoek's holotype. Their size is somewhat larger than in Hoek's immature material, though not yet quite

as large ('about 25 cm. in extent') as the specimens recorded by Hedgpeth (1948).

Characteristic of the species are the blunt eye tubercles, without eyes but with distinct lateral sense organs; the ear-like lobes at the antero-lateral angles of the cephalic segment; the (more or less distinct) groove immediately in front of the first pair of lateral processes; the very short terminal claw of the legs;

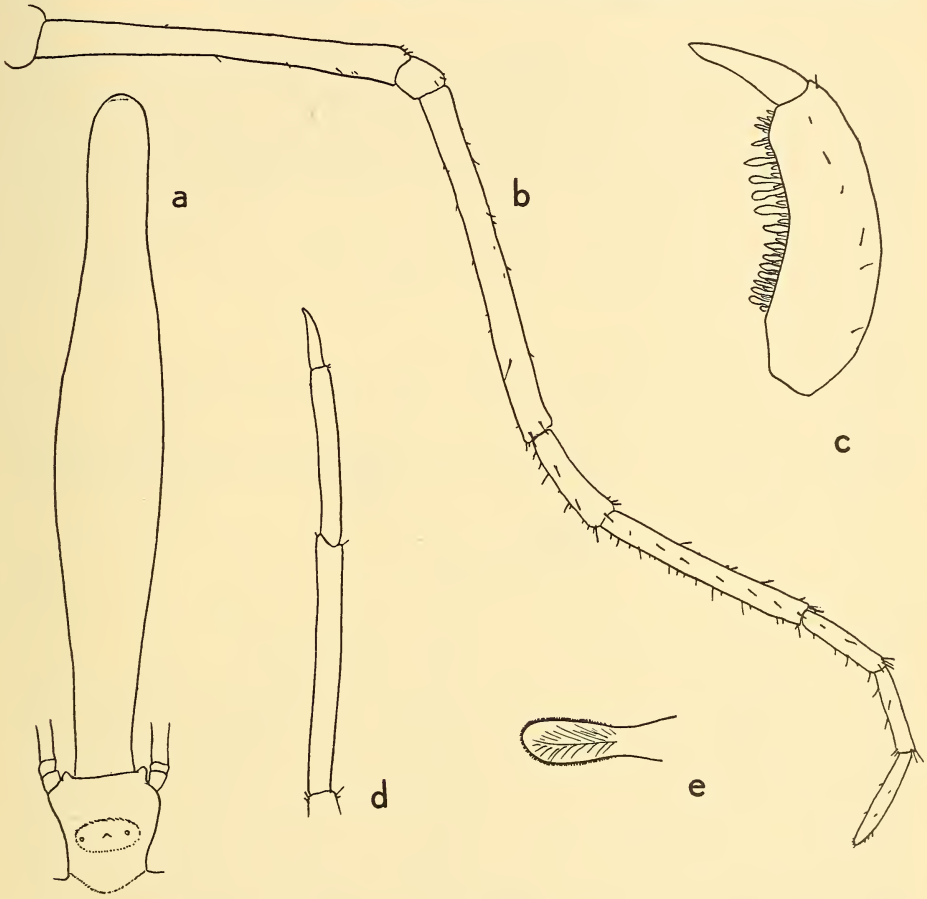

FIG. 4. *Colossendeis minuta* Hoek. *a*, neck and proboscis, in dorsal view; *b*, palp; *c*, terminal part of the oviger; *d*, distal segments of the fourth leg; *e*, compound spine from oviger segment 10.

the shape of the proboscis, that is about as long as the trunk; the relative length of the palp segments (3 as long as 5; 7 very long; 8, 9 and 10 subequal).

I consider Hoek's *C. japonica* identical with *minuta*. Hoek stressed the great similarity between the two forms, but kept them apart, chiefly because of the different number of oviger spines and the relative length of the distal segments of the legs. The number of oviger spines in *Colossendeis* is considered nowadays of less value than in Hoek's time, and as to the relative length of the distal

segments of the legs, the differences are too slight to be considered of specific value.

The ratios of tarsus, propodus, and claw of the 4th leg are:

in the holotype of *C. minuta* (cf. Gordon, 1944, p. 13, footnote)	1·5 : 1 : 0·46
in *C. japonica* (cf. Hoek, 1898)	1·5 : 1 : 0·44
in *C. minuta* (present material)	1·4 : 1 : 0·34
	1·45 : 1 : 0·34

The form recorded by Hedgpeth, 1949, and by Fage, 1956, under the name of *C. japonica* is quite distinct from Hoek's species. It has, as distinct from the real *japonica*, (1) a 5th palp segment that is at least $1\frac{1}{2}$ times as long as the 3rd; (2) a proboscis that is much longer than the trunk ($1\frac{1}{2}$–$1\frac{3}{4}$ times as long); (3) a very long terminal oviger claw; (4) the 6th and 7th palp segments subequal. All these features, and also the general aspect of the animal (Hedgpeth, 1949, fig. 46 *a*), indicate clearly that the animals in question belong to the *macerrima* complex, instead of to the *minuta* group.

Measurements in mm.

Proboscis: specimen 1, 9·5; specimen 2, 10·0.
Trunk, including abdomen: specimen 1, 12·5; specimen 2, 9·5.
Length of legs: 75.
Fourth leg: femur, 23·0; 1st tibia, 23·5; 2nd tibia, 18·0; tarsus, 3·5; propodus, 2·42; claw, 0·83.

Colossendeis oculifera n.sp.
(Fig. 5)

Material. 21 specimens, including 1 juvenile. Station A 193.

Description. The trunk is unsegmented. The lateral processes are separated by their own diameter. The conical eye tubercle varies somewhat in height (fig. 5 *c*, *d*); it is usually a very narrow cone with the slender apex directed forwards; in some specimens it is shorter (due to damage?). The 2 anterior eyes are much larger than the 2 posterior ones; all are well pigmented (brown in alcohol). Lateral sense organs, between the bases of the eyes, distinct. Cephalic segment without ear-like projections on the anterior margin. Proboscis narrowly cylindrical, straight, somewhat dilated in the middle, shorter than the rest of the body. Ratios proboscis : trunk + abdomen of 5 specimens (in cm.): 0·60 : 1·00; 0·77 : 0·90; 0·72 : 0·83; 0·80 : 0·98; 0·63 : 0·70. The abdomen is arched and somewhat clavate; it reaches to the middle of coxa 2 of leg 4.

Palp segment 3 slightly longer than 5; segment 7 twice as long as 6; segments 8, 9 and 10 subequal. Palp segments not very setose.

Ovigers slender; the 6th segment is a trifle longer than the 4th; the terminal claw is rather robust. The oviger spines on segments 7, 8 and 9 are longer than those on segment 10; they are tongue-shaped, and bear minute denticulations on the margin of their distal part.

Legs not very slender. In a specimen in which the trunk + proboscis measure 1·4 cm., the 3rd leg is 6·3 cm. In another specimen the femur is 1·95 cm., the 1st tibia 1·80 cm. and the 2nd tibia 1·73 cm.; the tarsus is 0·33 cm., the propodus 0·18 cm. and the claw 0·08 cm. The tarsus is always $1\frac{1}{2}$ to $1\frac{3}{4}$ times as long as the propodus. The ventral side of the tarsus bears some robust spines; the sole of the propodus bears 4 or 5 spines, one or two of which are very robust, in its distal fourth. The claw is much less than half as long as the propodus. Female sexual pores are distinct on a slight swelling of the ventral surface of the 2nd coxa of all legs. The juvenile in the present collection, though still having an incompletely developed oviger, already possesses all the characteristic features of the species: in the length of the proboscis, ocular tubercle, relative length of palp and of leg segments, and propodal armature.

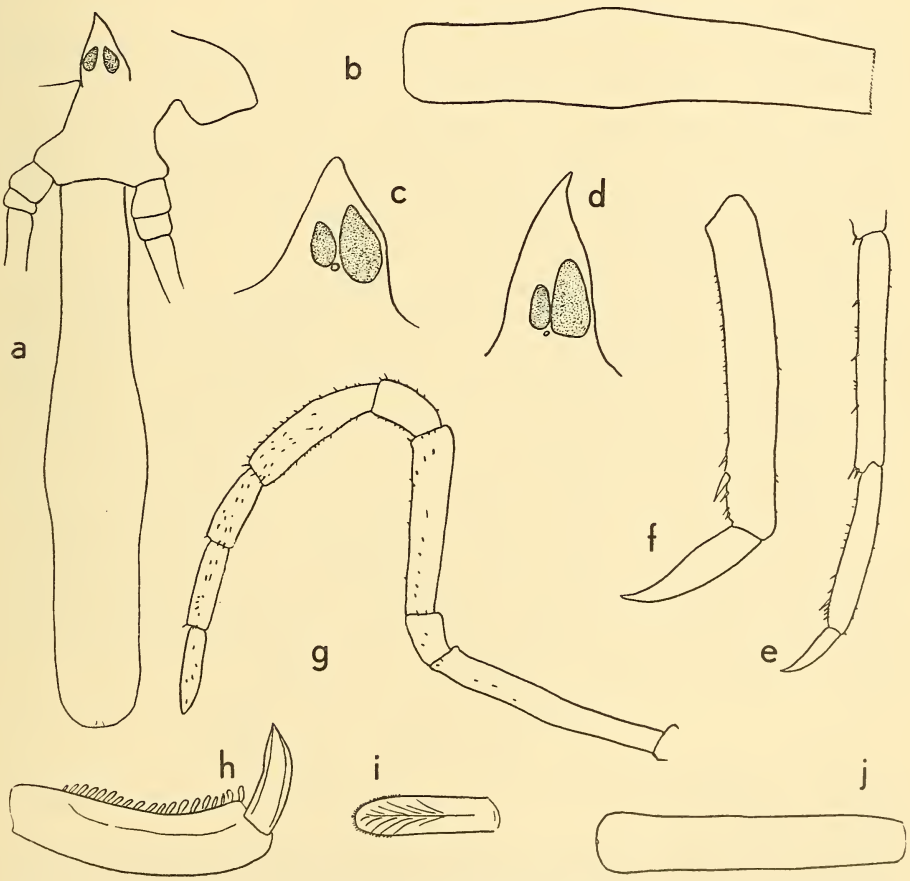

FIG. 5. *Colossendeis oculifera* n.sp. *a*, head and proboscis, in dorsal view; *b*, proboscis, from the left; *c*, *d*, ocular tubercle, from the right, of two different specimens; *e*, distal segments of a leg; *f*, propodus and claw; *g*, palp; *h*, distal part of the oviger; *i*, compound spine from oviger segment 7; *j*, abdomen in dorsal view.

Remarks. The only species of the brevitarsal group that shares the presence of a well-developed eye tubercle with a long 7th palp segment is *C. hoeki* Gordon, 1944. The latter has, however, the proboscis longer than the trunk, and the claw of the legs $\frac{3}{4}-\frac{4}{5}$ as long as the propodus. Moreover, the eyes of *C. hoeki*, though present, are unpigmented. We know nothing about the armature of the propodus of *C. hoeki*, but since Gordon compared this species with *C. gracilis*, *C. media*, *C. brevipes*, and *C. minuta*, all of which have practically unarmed propodal soles, we may safely assume that the sole of *C. hoeki* does not show such a curious armature as in the new species.

Longitarsal group

Colossendeis gracilis Hoek

(Fig. 6 *a*)

C. gracilis Hoek, 1881, pp. 69–70, pl. 9 figs. 6–8, pl. 10 figs. 6–7.

Material. 3 specimens, Station A 193; 6 specimens, Station A 315; 2 specimens, Station A 316; 1 specimen, Station A 319; 1 specimen, Station A 322.

Remarks. I am aware that most pycnogonid specialists have synonymized Hoek's *gracilis* with *C. angusta* Sars, but the present material (which I have compared with North Atlantic *angusta*) does not support this view. Calman, 1938, who was an advocate of the identity of *gracilis* and *angusta*, curiously enough stressed plainly their differences.

The South African material, consisting of adults and juveniles, agrees with *C. gracilis* (and consequently disagrees from *C. angusta*) in the presence of a highly conical, pointed ocular tubercle (fig. 6 *a*), in the 3 short distal palp segments (which are, combined, shorter than palp segment 7), in the small size (length trunk + abdomen 5–10 mm. in *gracilis*, 15–20 mm. in *angusta*), and in the relatively slender legs (6 to 7 times as long as the trunk + abdomen).

All specimens of *C. gracilis* in the present collection have neotenic chelifores, a phenomenon also met with, though much less frequently, in *C. angusta*.

Of the published records, only the North Atlantic (and possibly the North Pacific) ones belong to *C. angusta*. This species sometimes occurs in very shallow waters. The deep-sea records from the tropics and from the Southern hemisphere seem to belong to *C. gracilis*, but a revision of the material would certainly be necessary to make this statement more reliable.

Colossendeis curtirostris n.sp.

(Fig. 6 *b–h*)

Material. 1 ♀ (holotype), Station A 192. 1 specimen, Station A 315. 2 specimens, Station A 316.

Description of the holotype. Trunk elongated. Width across the 2nd lateral processes only slightly more than half the length of the trunk. Lateral processes separated by more than their own diameter. Intersegmental suture lines vaguely indicated (in other specimens absent), certainly no functional articulations present.

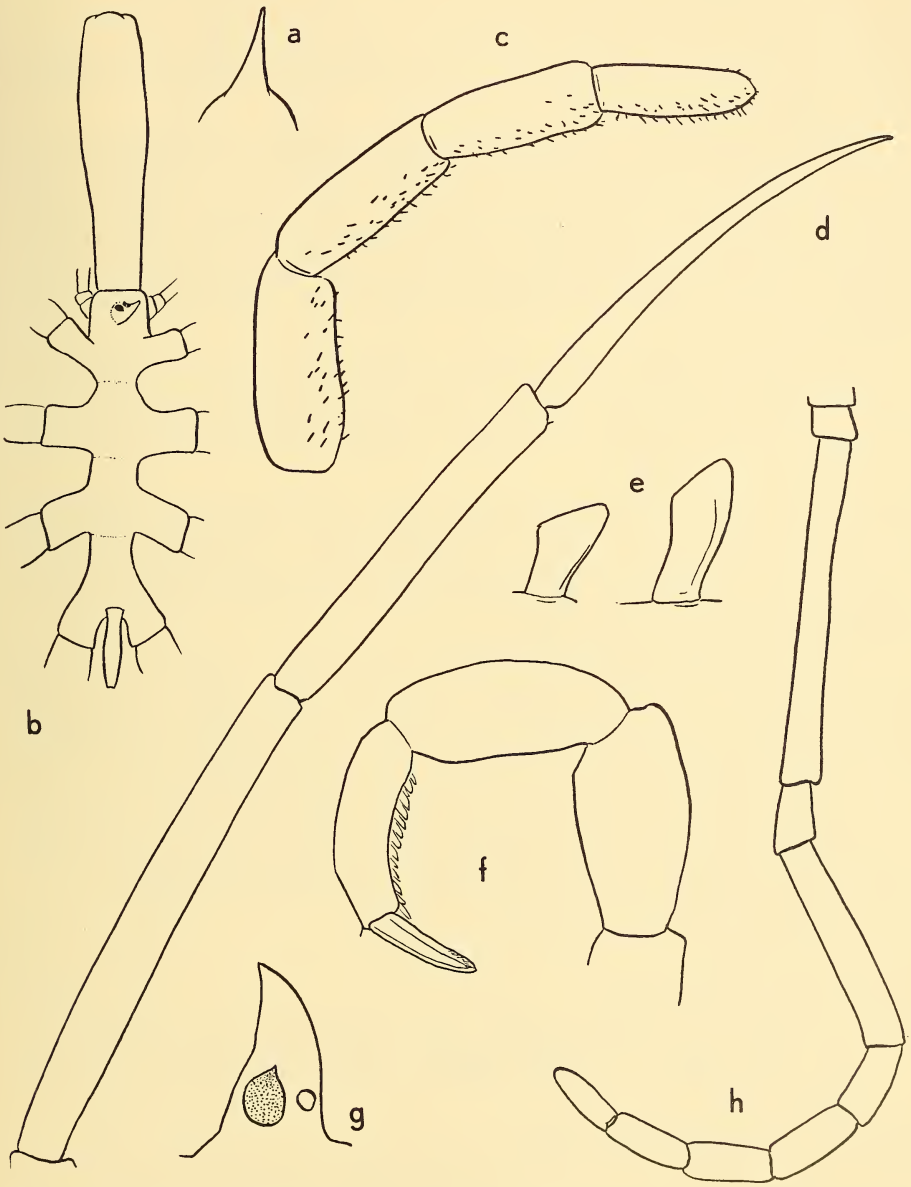

FIG. 6. (*a*) *Colossendeis gracilis* Hoek, front view of the ocular tubercle. (*b–h*) *Colossendeis curtirostris* n.sp. *b*, trunk in dorsal view; *c*, distal segments of the palp; *d*, distal segments of the first leg; *e*, two special oviger spines; *f*, distal part of the oviger; *g*, ocular tubercle from the left; *h*, palp.

Ocular tubercle highly conical, apical part bent forwards; anterior pair of eyes large, well pigmented, posterior pair very small, unpigmented (in some other specimens also the anterior eyes are not well pigmented). No anterior tubercles on the cephalic segment. Proboscis straight, only $\frac{3}{4}$ of the length of trunk and abdomen combined, somewhat club-shaped. Abdomen reaching nearly to the distal end of coxa 1 of leg 4.

No trace of chelifores. Palp segment 3 about $1\frac{1}{2}$ times as long as segment 5; of the 5 distal segments, segment 6 is the shortest, segment 7 the longest; the latter is slightly less than $2\frac{1}{2}$ times as long as wide; segments 8, 9 and 10 diminish gradually in length. Oviger segment 4 shorter than segment 6. Distal 4 segments with very densely placed, smooth-edged spines, mostly of a very peculiar, truncated appearance. Terminal oviger claw over half as long as the 10th segment.

Legs smooth, slender; 4th leg about 5 times as long as trunk and abdomen combined. Femur the longer segment. Tarsus at least $\frac{1}{3}$ longer than the propodus. Claw at least equal to the propodus. Propodal sole practically unarmed. The 2nd leg is the longest.

Remarks. The new species is apparently close to *C. drakei* Calman and *C. gracilipes* Bouvier (the latter being possibly synonymous with *C. glacialis* Hodgson). It has the smooth legs, the slender, non-globular distal palp segments and the long claw of *drakei*, and may represent a northern subspecies of this Antarctic and antiboreal shallow-water form.

C. curtirostris differs from *C. drakei* in the following respects: the much shorter proboscis, the longer abdomen, the more widely spaced lateral processes, the longer 2nd palp segment, the distal 4 palp segments that decrease successively in length, the simple oviger spines, and the longer tarsus.

Another South Atlantic species, *C. geoffroyi* Mañe-Garzón, is considered by its author to be close to *C. drakei*. This species differs from *curtirostris* in the more slender 7th palp segment, in the very short 8th palp segment, and in the lateral processes which are separated by less than their own diameter.

Measurements of the holotype (♀) *in mm.*

Length of proboscis . . . . . 7·3
Length of trunk + abdomen . . . . . 10·2
Palp—3rd segment, 4·05; 4th segment, 0·51; 5th segment, 2·67; 6th segment, 0·68; 7th segment, 0·91; 8th segment, 0·86; 9th segment, 0·82; 10th segment, 0·75
Diameter of 7th palp segment 0·38
Fourth leg—femur, 14·0; 1st tibia, 13·0; 2nd tibia, 11·5; tarsus, 5·5; propodus, 4·0; claw, 4·3

One of the specimens of Station A 316, a ♀, has the following measurements: proboscis, 8 mm.; trunk + abdomen, 11·5 mm.; width across the 2nd lateral processes, 6 mm.; total length 4th leg, 82 mm. This specimen has much longer legs (about 7 times as long as trunk and abdomen combined) than the holotype.

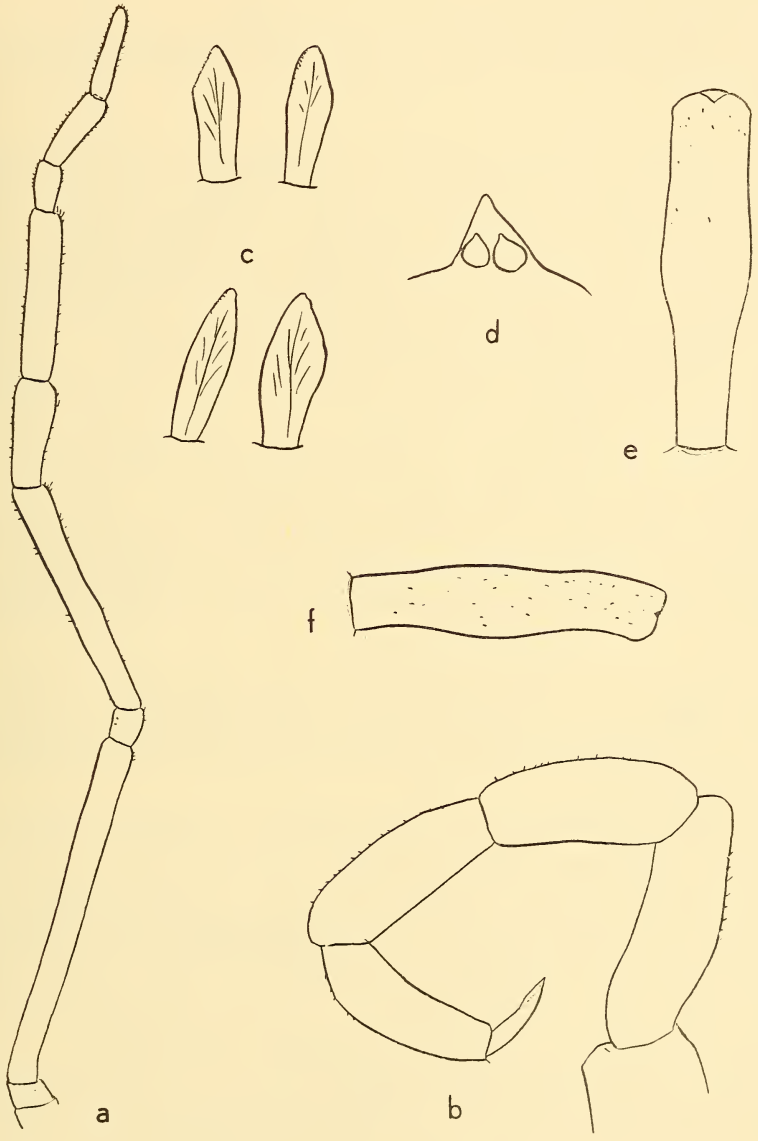

FIG. 7. *Colossendeis orcadensis* Hodgson, ♂ (Station A 322). *a*, palp; *b*, distal segments of the oviger; *c*, compound oviger spines; *d*, ocular tubercle, from the right; *e*, proboscis in dorsal view; *f*, proboscis from the right.

Colossendeis orcadensis Hodgson
(Fig. 7)

Colossendeis orcadense Hodgson, 1908, pp. 161, 184–186, pl. 2 fig. 3.

Material. 1 flabby specimen, Station A 192; 4 small specimens, Station A 193; 1 large ♂, Station A 315; 1 small specimen, Station A 316; 1 large ♂, Station A 322.

Remarks. Since the original description in 1908, this species has not been found again. The holotype and only specimen known was taken at the South Orkneys. The depth is not given, but in the introduction of Hodgson's account we find the following indication: 'it [= *C. orcadensis*] is quite blind—not an unusual character of the genus, but the more surprising as it is a shallow-water species.'

The present material, taken in the deep sea, is, as far as we can judge from the poor illustration of the holotype, identical with *C. orcadensis*.

The following measurements are derived from a big male specimen (Station A 315): Length of proboscis, 19 mm.; length trunk + abdomen, 15 mm.; length 2nd leg, 119 mm.; femur, 34 mm.; 1st tibia, 27 mm.; 2nd tibia, 22 mm.; tarsus, 12 mm.; propodus, 8·7 mm.; claw, 6·2 mm.

Another large male (from Station A 322) has distinct, although unpigmented, eyes. In all other specimens eyes are lacking. The specimen with eyes comes close to *C. megalonyx* Hoek; as a matter of fact, I believe that, when more material becomes available, we shall have to synonymize *orcadensis* and *megalonyx*.

Genus PANTOPIPETTA nom. nov.

It is a regrettable circumstance that the generic name *Pipetta* Loman, 1904, used universally in our pycnogonid literature, is preoccupied by Haeckel, 1887, for a genus of Protozoa. Reluctantly, I propose the new name *Pantopipetta* for the pycnogonid genus.

This curious deep-sea genus is represented in the present collection by not less than 3 species: *P. capensis* (Barnard), which was hitherto known from a single specimen only, *P. brevicauda* n.sp., and *P.* spec. (? *longituberculata* Turpaeva). All are present in fair numbers of both sexes. It is remarkable that, although several females are quite mature (bearing fully developed eggs in their trunks and legs), no ovigerous males are known. This, together with the structure of the oviger, in which segments 2, 4 and 6 are elongated, is a strong indication for attributing the genus to the family Colossendeidae.

I insert here (fig. 8 *f–h*) some new illustrations of the genotype, *P. weberi* (Loman), drawn from the holotype and only specimen known. This species is chiefly characterized by its low ocular tubercle (which may, however, be the result of a previous injury), but also by the very slender 2nd coxa and the long 5th palp segment.

The species of the genus are very similar to one another; they are known from some widely scattered localities in the deep sea: northern Pacific (Kurile-Kamchatka trench), East Indies, Antarctic, and off South Africa.

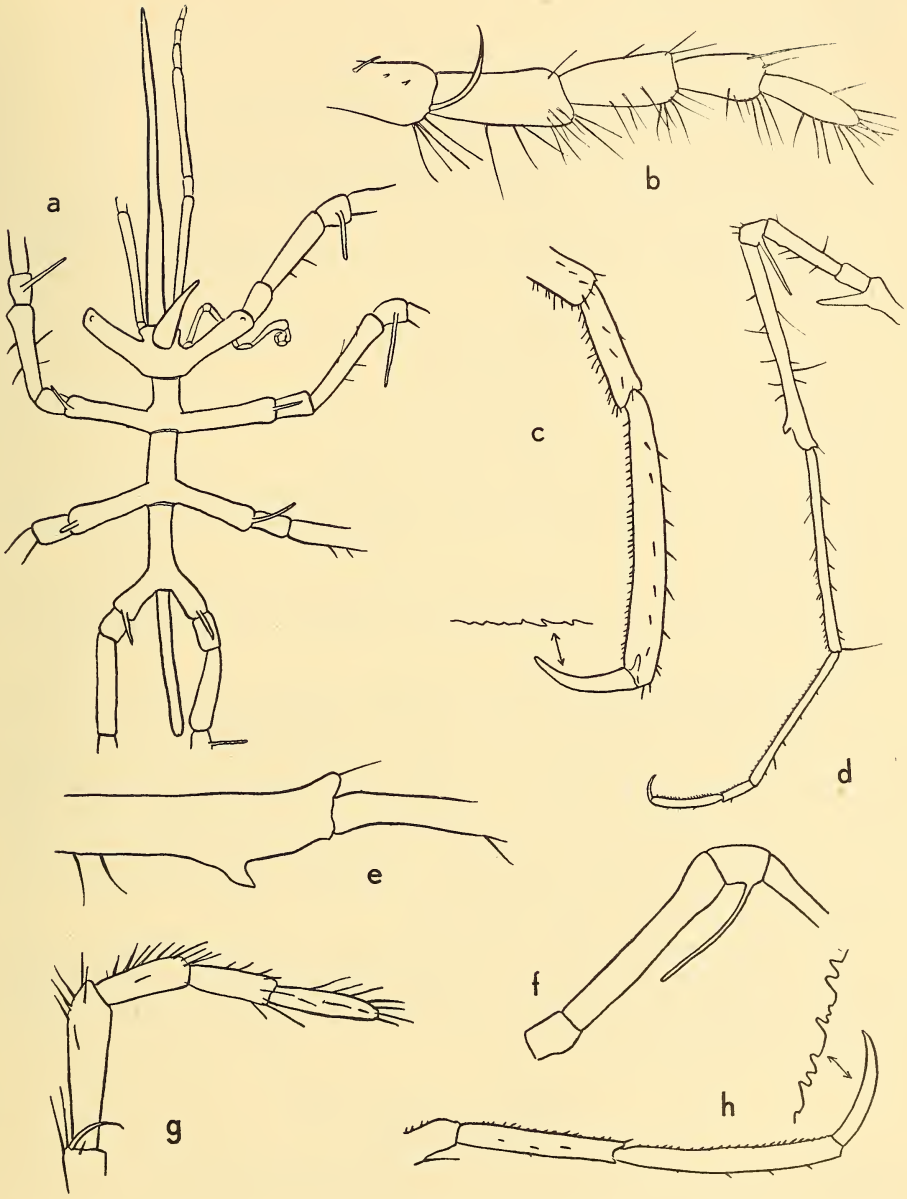

FIG. 8. (*a–e*) *Pantopipetta capensis* (Barnard). *a*, trunk in dorsal view (♀); *b*, distal segments of the palp (♂); *c*, distal segments of the third leg (♀); *d*, third leg (♂); *e*, terminal part of the femur, with the cement gland cone (♂). (*f–h*) *Pantopipetta weberi* (Loman), ♀ (holotype). *f*, coxae; *g*, distal part of the palp; *h*, distal segments of the leg.

Key to the known species:

1 (*a*) Lateral processes smooth, 2.
(*b*) Lateral processes 2, 3 and 4 with a long dorsal spur; lateral process 1 with a dorsal tubercle. *P. capensis* (Barnard, 1946).

2 (*a*) Propodus 5 to 6 times as long as the tarsus. *P. australis* (Hodgson, 1914).
(*b*) Propodus less than 4 times as long as the tarsus, 3.

3 (*a*) Abdomen reaching to the distal end of coxa 1 of leg 4. *P. brevicauda* n.sp.
(*b*) Abdomen reaching nearly or entirely to the distal end of coxa 2 of leg 4, 4.

4 (*a*) Ocular tubercle high conical. Coxa 2 about 4 times as long as its distal diameter. *P. longituberculata* (Turpaeva, 1955).
(*b*) Ocular tubercle low. Coxa 2 at least 6 times as long as its distal diameter. *P. weberi* (Loman, 1904).

Pantopipetta capensis (Barnard)
(Fig. 8 *a–e*)

Pipetta capensis Barnard, 1946, p. 60. Barnard, 1954, pp. 86–88, fig. 1.

Material. 8 ♀, 6 ♂ and 1 juvenile. Station A 193.

Remarks. Only 1 specimen, judging from Barnard's figure a female, of this interesting species was known. It was taken off Cape Point, N. 81° E. 32 miles, in 460 fathoms.

The present material, from the same general region, but taken in a much greater depth (1,500–1,580 fathoms) agrees perfectly with the description of the type.

The sexual differences are feebly developed; no such differences are found in the palps, ovigers and legs, with the exception of the presence in the male of a cement gland cone on the femur. This 'cone' or projection is situated at a slight distance from the distal end of the femur, somewhat variable in shape in different individuals, but roughly triangular in outline. Nothing about this cone was known in literature, although I suppose that the projection figured very vaguely and described superficially by Hodgson (1927) on the femur of *P. australis* is in fact the cement gland cone.

One of the specimens shows a curious anomaly: the first left leg, its corresponding lateral process and the left oviger have disappeared, probably as a result of a previous injury. Since no scar is visible, the animal in question offers a peculiar unbalanced aspect.

Pantopipetta brevicauda n.sp.
(Figs. 9, 10 *a*)

Material. 3 ♂, 3 ♀, 1 juvenile. Station A 193.

Description. Very slender. Body and appendages appreciably more delicate than in *capensis*. Trunk completely segmented. Lateral processes smooth, separated by intervals that are 2 to 3 times as large as their own diameter (slightly narrower between the lateral processes of segments 1 and 2). Eye tubercle a very tall cone; no eyes. Abdomen separated from the trunk by a

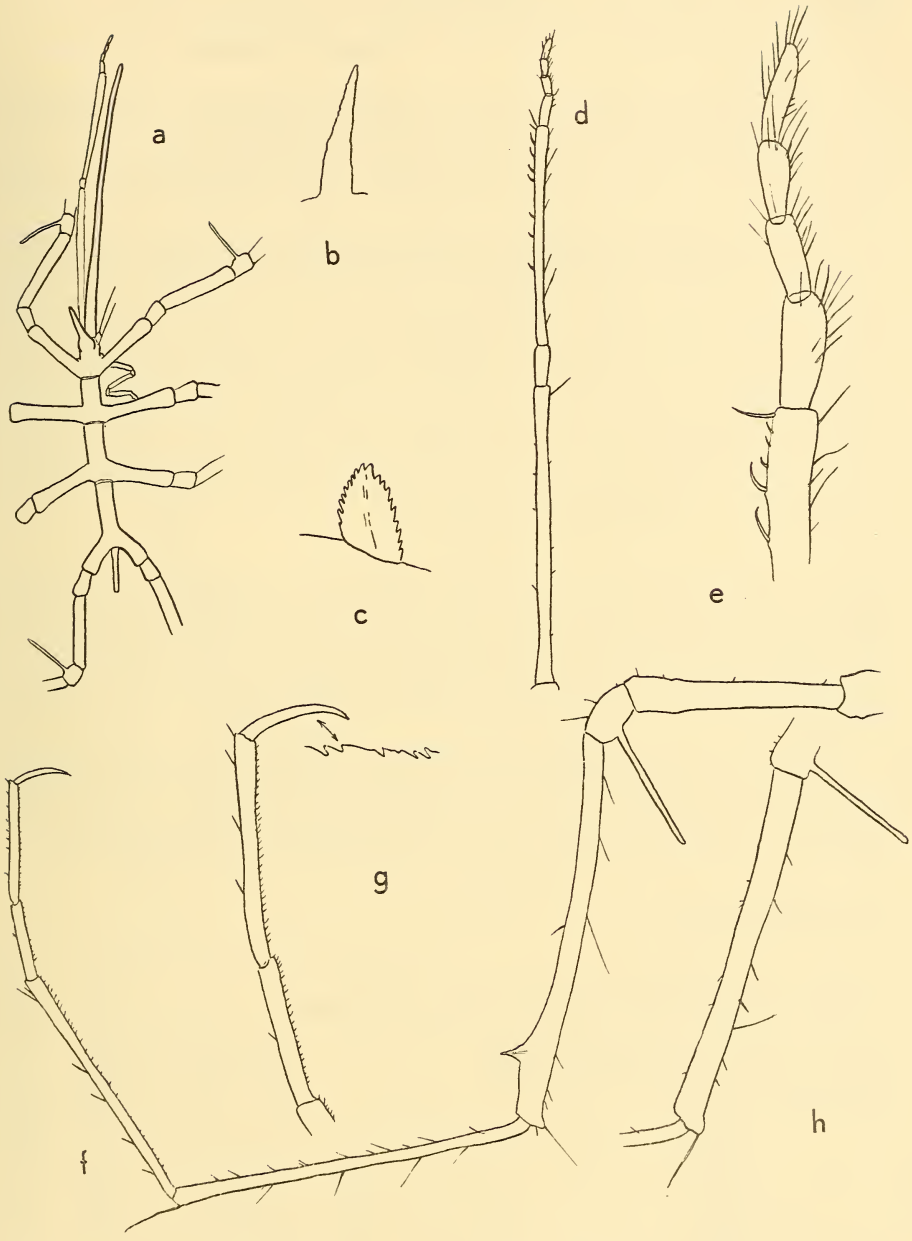

FIG. 9. *Pantopipetta brevicauda* n.sp. *a*, dorsal view of the trunk (♂); *b*, ocular tubercle in front view (♂); *c*, special spine from oviger segment 8; *d*, palp (♂); *e*, distal segments of palp (♂); *f*, third leg (♂); *g*, distal segments of the third leg (♂); *h*, femur (♀).

kind of suture, short, just reaching to the end of coxa 1 of leg 4. Proboscis tubiform, longer than the trunk and the abdomen combined.

Palps practically as in *capensis*, the 5th segment being less than 3 times as long as wide.

Ovigers also very similar to those of *capensis* (and of *weberi*). The formula of the compound spines on the distal segments is in a dissected ♀ 3 : 2 : 2 : 3 :: 0, in a dissected ♂ 3 : 1 : 2 : 3 :: 0. The shape of the compound spines is as in *capensis*.

Legs very slender, except for the sexual pores and the cement gland very similar in both sexes. Coxa 2 about 5 times as long as wide; coxa 3 with a long, twig-shaped, flexible dorsal projection. Femur with an inconspicuous distal spur; on the ventral surface of the femur of the ♂, not far from the distal end, a conical projection indicates the place where the cement gland discharges. Tibia 1 subequal to the femur; tibia 2 much shorter. Tarsus about $\frac{2}{3}$ of the propodus. Claw half as long, or slightly less than half as long, as the propodus. Inner margin of the claw armed, as in *P. capensis* and *P. weberi*, with irregular denticulations. Ventral margin of propodus, tarsus and distal part of tibia 2 armed with a row of minute spinules.

Remarks. Though occurring at the same station as *P. capensis*, the new species differs clearly from it, even at first sight, by its much more delicate appearance. The absence of projections on the lateral processes, the shorter abdomen and the different proportions of the distal segments of the legs form useful additional distinctions.

The only species which has about the same relative length of tarsus, propodus and claw is *P. weberi*. However, this East Indian species has the 5th palp segment much slenderer (about 4 times as long as wide), a much longer abdomen (reaching the end of coxa 2 of leg 4), and a short eye tubercle.

Measurements in mm.

	♀	♂
Length of proboscis	3·07	3·16
Length (frontal margin of neck to base of abdomen)	2·19	2·19
Length of abdomen	0·53	0·65
Width across 2nd lateral processes	1·74	1·67
Third leg—coxa 1	0·28	0·28
coxa 2	0·98	1·02
coxa 3	0·23	0·19
femur	1·91	1·91
tibia 1	1·86	1·86
tibia 2	1·35	1·33
tarsus	0·40	0·37
propodus	0·60	0·56
claw	0·28	0·28

Pantopipetta sp.
(Fig. 10 *b–c*)

Material. 1 ♂, 1 ♀. Station A 316.

Remarks. The two available specimens can be distinguished from both *capensis* and *brevicauda* by their much more robust appearance and less spaced lateral processes. They come close to *P. longituberculata* (Turpaeva), a deep-sea species from the Kurile-Kamchatka trench, except for the relatively longer propodus in the South African material, without attaining the enormous elongation found in *P. australis*. In *longituberculata* the propodus is less than 3 times as long

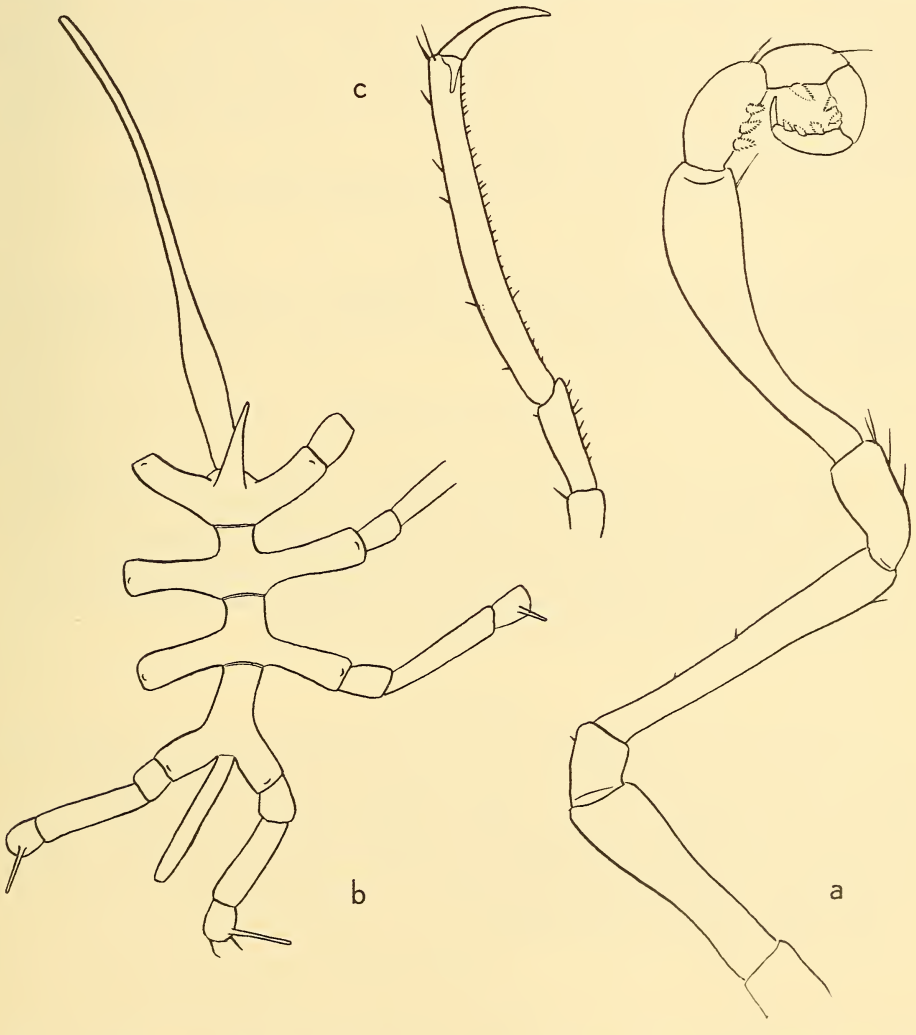

FIG. 10. (*a*) *Pantopipetta brevicauda* n.sp., oviger (♂). (*b–c*) *Pantopipetta* spec., ♀. *b*, dorsal view of the trunk; *c*, distal segments of the fourth leg.

as the tarsus, in the present specimens more than 3 times as long, while in *australis* it is 5 to 6 times as long. The lateral processes bear a low elevation on their dorsal surface. The ♀ has a proboscis of 4·6 mm.; the trunk is 3·6 mm. and the abdomen 1·3 mm. in length. The male is too much damaged to give exact measurements.

Anoplodactylus pelagicus Flynn

Anoplodactylus pelagicus Flynn, 1928, p. 25, fig. 14. Barnard, 1954, p. 128, fig. 19.

Material. 1 ♂ (damaged), Station A 316. 1 ♂ (damaged), off Cape Natal (Durban), 24 miles, 440 fathoms (don. Dr. K. H. Barnard). Z.M.A. Pa. 1327.

Remarks. The specimen from Station A 316 differs from Barnard's material (described in his 1954 paper) in having a highly conical ocular tubercle. Eyes, however, are, as in the previously recorded material, absent. Otherwise very similar to the published descriptions.

The species has up to now not been recorded below 300 fathoms.

Summary

A systematic account is given of a collection of Pycnogonida from the abyssal zone of the sea south-west of Cape Town. The collection included 12 species, 5 of which are new.

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References

The works cited in this paper can be found in the bibliography of my 1956 paper; and those published prior to 1935 also in Helfer & Schlottke. Not included in these bibliographies are:

Fage, L. 1956. Les pycnogonides (excl. le genre *Nymphon*). *Galathea Rep.* **2,** 167–182.

Helfer, H., and Schlottke, E. 1935. Pantopoda. *Bronn's Klassen* **5,** Abt. 4, Buch 2, 1–314.

Stock, J. H. 1956. Tropical and subtropical Pycnogonida, chiefly from South Africa. *Vidensk. Medd. dansk naturh. Foren. Kbh.* **118,** 71–113.

Turpaeva, E. P. 1955. [New species of Pantopoda from the Kurile-Kamchatka trench.] *Trud. Inst. Okeanol.* **12,** 322–327. [In Russian.]